COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

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Bay State Gas Company	)	**D.T.E. 05-27**
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DIRECT TESTIMONY OF ALVARO E. PEREIRA

FOR THE MASSACHUSETTS DIVISION OF ENERGY RESOURCES

I. INTRODUCTION

Q. Please state your name, business address and employment position.

A. My name is Alvaro E. Pereira. My business address is 100 Cambridge St., Boston, MA 02114. I am Manager of Energy Supply and Pricing at the Commonwealth of Massachusetts Division of Energy Resources (DOER), a position I assumed in December of 1999. I have overall responsibility for the Division's analytical and modeling work as well as primary responsibility for policy development regarding energy markets and reliability.

Q. Please describe your education and professional background.

A. Prior to my current position, I was Senior Economist at the Division of Energy Resources. As part of this position, as well as my current work, I have been responsible for electricity and gas industry economic analyses and forecasts and conducted economic and market impacts of energy-related policies and investments. I have also provided technical support and analysis of utility rate design and stranded costs, performance-based rates and benchmarking, market power, wholesale-market bidding behavior and procurements, and economic impacts of energy efficiency and environmental policies, among other areas. I came to DOER from the Massachusetts Institute of Technology (MIT), where I was Visiting Lecturer and Research Associate from September 1991 to February 1999. While at MIT, I taught graduate-level courses in Transportation Economics and Regional Economic Methods and Modeling and completed research studies in the areas of industrial business processes, transportation economics, and the economic modeling of environmental impacts, among others. My education consists of Bachelor degrees in Economics and Finance from the University of Massachusetts at Amherst, and a Master's Degree in Civil Engineering and a Ph.D. in Urban and Regional Economics from MIT.

Q. Have you previously testified before the Department of Telecommunications and Energy?

A. Yes. I filed direct testimony in DTE 04-121.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to present DOER's concerns about certain aspects of the proposed rate adjustments found in Bay State Gas' (the Company's) petition. First, DOER

believes that removal of the costs for the Steel Infrastructure Replacement program (SIR) from base rates weakens any incentives that would be derived from application of a performance-based regulation plan (PBR). Second, in light of a weakened, partial PBR, the earnings sharing mechanism that was approved for Boston Gas in DTE 03-40, and has been proposed by the Company in the current proceeding, is not appropriate. Third, the proposed dual fuel provision (M.D.T.E. No. 67) is not supported by any accounting of the actual costs and/or lost revenues incurred to serve dual fuel customers and does not consider the potential benefits of fuel switching to Bay State's customer base.

Q. Can you summarize your recommendations?

A. Yes. First, the Department should disallow the Company's request to exclude from base rates (and, concomitantly, from the PBR mechanism) annual base rate adjustments to fund the SIR program and adjust the Company's PBR proposal downward to apply only to O&M costs. Second, the earnings sharing mechanism should be adjusted to better reflect the relatively riskless nature of gas distribution and bandwidths that have been approved elsewhere; this is especially true if the Department decides to remove costs from the SIR program from base rates. Third, the Department should disallow the Company's proposed tariff changes for dual fuel firm service customers (M.D.T.E. No. 67).

II. Performance Based Ratemaking and the Steel Infrastructure Replacement Program

Q. Do you support the use of a PBR mechanism in this case?

A. Yes, as long as the proposed plan advances the Department's objectives of economic efficiency, cost control, lower rates, and reduced administrative burden in regulation, and provision of safe and reliable energy service that were set out in DTE 94-158.

Q. Does the proposed PBR plan meet these objectives compared to the Company's current rate regulation?

A. No. The proposed PBR plan represents a step backwards in terms of the evolution of incentive regulation as applied by the Department over the past decade. In particular, the Company is proposing a partial PBR that caps only a portion of their costs, thus limiting the

level of incentive for the Company to control its costs and improve productivity, thereby lowering the potential savings that would be normally possible under incentive regulation. The removal of the costs to fund the SIR program, a large capital cost, re-introduces one of the major deficiencies of traditional cost of service regulation—the incentive for a utility to use too much capital relative to labor in order to increase its revenues. This result of lower incentives to control costs is further compounded by the Company's request to remove pension and postretirement benefits other than pensions (PBOP) expenses from base rates and into a reconciling mechanism that would not be subject to the PBR plan. In addition, rather than reduce administrative burden through the avoidance of more frequent rate cases, the collection mechanism for the SIR will require annual proceedings.

Q. Does the PCI proposed by the Company include capital costs?

A. Yes. First, the GDP-PI is a broad measure of price inflation in the economy and includes all inputs involved in production. Similarly, the X-factor relies on total factor productivity data and input price trends that include all inputs.

Q. Will the proposed price cap index (PCI) apply only to O&M costs?

A. Though Dr. Kaufmann only uses O&M costs in his econometric model, apparently the PCI will apply to all existing costs that are in the "cast off rates" minus the SIR program and the pension related costs that have been moved out of rate base. These cast-off rates include capital costs.

Q. Why would the Company continue to apply the PCI to existing capital costs?

A. The Company has not provided a complete explanation concerning why they have proposed to apply the PCI to existing capital costs. A PBR plan is an incentive mechanism that is applied to all costs in order to provide incentives for efficiency gains through investment in and substitution among all inputs. Dr. Kaufmann's response to DTE 4-42 provides an excellent overview of the different types of efficiency that a PBR plan can permit or motivate. Given that the Company believes that "most of the incremental efficiency gains that may be achieved during the term of a PBR plan will result from O&M savings" (Response to IR DTE 4-2), I see little benefit to applying the PCI to existing capital or "sunk" costs. According to the Company's response to Information Request (IR) DOER 1-

15, O&M has accounted for about 48.5% of total costs over the 1999-2003 time period. Hence, less than 50% of the Company's costs would be theoretically influenced by the incentives of the PBR plan. In short, if the Company's proposal is approved, ratepayers would be paying for a comprehensive PBR but only receiving the benefits of a partial PBR.

Q. By excluding the SIR program from the PBR is the Company making any conclusions about the effectiveness of a PBR to control SIR-related costs?

A. Yes, analogous to its treatment of pension-related costs, the Company sees the costs involved in the SIR program as non-discretionary and basically beyond the Company's controls. As Mr. Bryant (Exh. BSG/SHB-1, pp. 39-40) explains, these investments are non-discretionary and eroding of the Company's ability to earn its required rate of return. In short, the Company sees these investments as necessary and their costs as beyond the control of the Company. Costs that are beyond management's control are obviously not good candidates for incentive-based ratemaking.

Q. Why has the Company proposed a partial PBR?

A. The reasoning for using a partial PBR is confused. On the one hand, the Company is proposing to apply the PCI to the cast-off rates that include non-O&M costs, thereby leading to the conclusion that Company's PBR is partial only with respect to a temporal distinction in costs. However, Dr. Kaufmann states that one of the reasons that focusing on O&M costs provides a "complete evaluation of utility managers' cost performance" is that "most such costs reflect capital investment decisions that were made in the (often distant) past and which current managers cannot undo" (Response to IR DTE4-2). Thus, even though capital costs in the past are sunk and largely beyond management control, the Company is still proposing to apply the PBR mechanism to these costs. On the other hand, capital costs going forward, such as those for the SIR program, and pension costs are subject neither to the PBR mechanism nor to the controls and requirements provided by traditional cost of service regulation.

Q. Would you explain how the application of a partial PBR affects the rates paid by customers?

A. Yes. The first impact is to increase the level of uncertainty in future rate changes. The Company has been unable or unwilling to provide a schedule of anticipated annual

investments, instead providing sample calculations for the first two years of its SIR program. Rate changes due to these investments thus will be uncertain. By contrast, PBR-related rate changes are limited to inflation minus a known X-factor, and even though they are done on an annual basis, can be predicted or anticipated in a more certain way. Second, rates to ratepayers will be higher under the SIR program because these costs are not capped by a PBR and the Company has little or no incentive to control the costs of these investments. In the response to IR DOER 1-9, the Company provides estimates of illustrative bill increases from the PBR, SIR, and the EES adjustments in Year One of implementation of the respective adjustment mechanisms. The data show that the SIR adjustments are over twice that of the PBR adjustments for all rate classes.

Q. Have the reasons for the Company's proposed partial PBR been used elsewhere?

A. I have not seen another example of an SIR mechanism used in conjunction with a partial PBR. There have been cases where a PBR has been applied to a portion of the Company's costs due to lack of unavailable data.

Q. What role does the econometric model play in the Company's PBR proposal?

A. The econometric cost benchmarking study is used to support the Company's proposal for the consumer dividend. I say "support" because the cost model does not actually determine or calculate the consumer dividend in any way. Rather, the cost study's results provide evidence to support the logic behind Dr. Kaufmann's recommendation, which is related to the benchmarking work that was done for Boston Gas in DTE 03-40. In that case, Dr. Kaufmann estimated a cost function for Boston Gas' total costs and found that Boston Gas costs' were 27% below their predicted value, thus leading to the conclusion that Boston Gas was a superior cost performer. Dr. Kaufmann estimated a similar cost function for Bay State Gas with the significant difference being capital costs were excluded. The results for this cost function shows that Bay State costs were 14.4% below their predicted value, thus leading to the same conclusion for Bay State Gas and leading to a recommended consumer dividend that is the same as the one approved by the Department in DTE 03-40. However, the two cost studies are quite different and cannot be compared (see response to DOER-1-16), notably because of the exclusion of capital costs in the Bay State model. Given that the

Company is proposing the PCI to apply to all existing costs, the econometric model needs to account for the impacts of the rate freeze on capital costs in order to make the use of the econometric results valid as a predictor of future productivity gains from application of a PBR plan.

Q. Would inclusion of capital costs in the econometric model change his recommendations?

A. Dr. Kaufmann has provided results of including capital (and other) costs in his econometric model in response to IR DTE 4-10. The results show that including capital costs weakens the econometric specification significantly enough that Dr. Kaufmann would not change his recommendations based on inclusion of the additional cost factors. In particular, the variable that was supposed to control for the capital vintaging concerns expressed by the Department in 03-40 is not statistically significant when capital costs are included in the specification. Despite the problems with the particular estimation shown in the response to IR DTE 4-10, the model shows that the Company actually performed worse (in terms of total costs) than the predicted value of the model, instead of showing that Company was an excellent performer.

Q. What would you recommend for a PCI?

A. I recommend a partial application of the Company's proposal for the PCI to the portion of cast-off rates that relate to O&M costs. As discussed above, that portion is approximately 48.5%, thus resulting in the following formula for the growth rate in the PCI:

$$PCI_t/PCI_{t-1} - 1 = 0.485\ ((GDP\text{-}PI_t/GDP\text{-}PI_{t-1} - 1) - 0.41) + Z_t.$$

Use of this PCI implies that the rest of the Company's costs are under a price freeze, which is consistent with the view that most of these costs are sunk and unlikely to change in any meaningful way. Moreover, I have seen no evidence to indicate that the price freeze of the past few years had any impacts on reducing non-O&M costs.

III. Earnings Sharing Mechanism

Q. What is the role of an earnings sharing mechanism (ESM) in a PBR?

A. Consistent with the objectives of incentive ratemaking, an ESM is usually included in a PBR to provide some protection to the Company and ratepayers for large variations in actual earnings, as expressed by some metric, usually return on equity. A major characteristic of incentive ratemaking is the freedom given to utilities to manage their operations in order to maximize their rates of return. An earnings sharing mechanism provides some control on (or sharing with ratepayers of) excessive returns while at the same time allowing the possibility for a utility to earn extranormal returns and avoiding more frequent, comprehensive rate cases when earnings may fall below a utilities' requirements.

Q. What is the basis for the Company's proposal for an earnings share mechanism?

A. The Company has proposed an identical ESM to the one that was approved in both the original and updated PBR plans for Boston Gas. The Company has given no explanation or provided no background analysis for proposing their ESM other than that the proposal is consistent with Department precedent, as shown by the Department's acceptance of the proposal in two prior cases.

Q. Should the "generation" of the PBR affect the parameters of the proposed ESM?

A. Yes. A well-designed ESM should account for the potential for cost savings and the difficulty of achieving those savings. In addition, a well-designed ESM should account for the potential variability in earnings due to the potential for cost savings and thus extranormal earnings or risks to the Company's necessary rate of return. By definition, a first generation PBR features the potential for the greatest amount of savings at the least costs, and thus potentially greater variation in earnings than later-generation PBRs.

Q. Is the Company's basis reasonable?

A. No. Leaving aside that Boston Gas and the Company may have different business and risk profiles, there is the critical difference between Boston Gas' prior approved plans and Company's proposed plan concerning the coverage of the PBR. As mentioned above, the Company's proposed PBR is partial and only covers a portion of the Company's cost. In particular, the costs for the SIR program have a guaranteed rate of return, which reduces the

volatility in earnings and incentives available to mitigate costs, and thus may influence the metric used in the ESM. More importantly, most of the Company's costs going forward are beyond the influence of incentives provided by PBR and Dr. Kaufmann has testified that "the Company has fewer opportunities to achieve incremental productivity gains in the future" (BSG/LRK-1, p. 15). Together, these two imply that the Company believes dramatic innovations would be necessary to create large increases in productivity and therefore large savings and increases in ROE.

The Company's ESM proposal is highly regressive with shareholders receiving all of the first dollars saved and most of the later dollars saved. The proposal is problematic for two reasons. First, the potential for ratepayers to actually capture savings or productivity improvements that would result from a rate-indexing PBR or rate freeze is extremely low. Second, the proposed mechanism provides the Company with incentives to go after "easy" dollars first and more difficult, revolutionary savings measures last, which is the exact opposite of the desired effect for a Company that has few opportunities to increase its productivity.

Q. How does the Company's proposal compare to similar ESMs in other jurisdictions?

A. Table 1 shows a comparison of ESMs in other jurisdictions. Though probably not an exhaustive list, the data show that both the size of the proposed bandwidth and the extent of sharing with ratepayers is heavily tilted towards shareholders relative to ESMs found in other jurisdictions.

Q. What would you recommend for an earnings sharing mechanism?

A. I would recommend a much more progressive ESM that returns any initial productivity gains going forward back to consumers. Only at high rates of return or ROEs, outside of a reasonable bandwidth, such as 200 basis points, should the Company retain some percentage of earnings. A 75% to shareholders and 25% to ratepayers split should only be applied after any initial savings have been passed to the Company's customers. Conversely, earnings that fall below the target ROE are retained by the Company but ratepayers should not have to be charged for any deficiencies in earnings due to the relative riskless nature of Bay State's rate proposal. A progressive ESM is also needed to ensure that the Company has some incentive

to pursue productivity-enhancing investments and costs, especially in light of the Company's requests to remove a good portion of their costs from the incentive mechanisms provided by a PBR.

Q. Assuming that the costs of the SIR would be subject to a PBR, would that change your assessment of the Company's proposed ESM?

A. Possibly, the Company has not provided the data necessary for a complete answer to this question, but assuming that future capital costs relevant to the SIR were to be capped by a PBR, the Company may require protection against earnings below the agreed upon benchmark. Thus, a sharing of downside risk with ratepayers would be appropriate. In terms of earnings above the benchmark, I would not alter my recommendations in any drastic fashion. The bandwidth, in particular, is too broad, thus making sharing with ratepayers difficult. A 200 basis point bandwidth provides the Company with incentives to control its costs while returning some of the productivity benefits of a PBR plan back to ratepayers.

IV. Dual Fuel Firm Service Customers

Q. What is the basis for the Company's proposed special provision M.D.T.E. No. 67?

A. The Company believes that customers who have dual-fuel capability have the potential to "shirk the costs associated with the reliability that they receive under firm service." In short, the Company is worried about lost revenues due to fuel switching.

Q. Will acceptance of this provision lessen the Company's exposure to volatility in revenues?

A. Presumably, yes, that is the major impetus behind the addition of the special provision. This minimum revenue threshold should provide additional certainty to the Company's expected rates of return over the PBR plan.

Q. Has the Company provided any estimates of the lost revenues or the impacts on cost recovery to other customers that have resulted or will result from fuel switching?

A. No. The Company has not provided cost support for the proposed schedule. In particular, the Company has not shown that the variation in usage by these customers would necessitate a special provision any more or less than needed by normal swings in usage during the year or changes in distribution system load due to commercial accounts coming onto or leaving

Company service or the variation in commercial load due to business cycles or changes in production. The Company has also not explained how the minimum annual revenues in the provision were derived. At a minimum, the Department should require the same level of scrutiny and quantification as required with recovery of lost revenues due to implementation of energy efficiency measures.

Q. Does the proposed schedule account for any benefits to ratepayers?

A. It is unclear. The Company did not provide any data or calculations to support the terms found in the provision so it is unknown whether benefits, such as reduction of gas costs during peak times, were included

Q. Is it possible that such benefits could exceed the additional costs that the Company claims would be shifted to other customers?

A. Yes. Dual-fuel customers would most likely fuel switch when natural gas costs are high relative to the alternative fuel, which is most likely during times when natural gas prices are highest, during the winter heating season. The gas that is displaced could then be used for other customers, thereby reducing the need for the Company to purchase supplies at potentially high prices during peak times.

Q. What is your recommendation regarding the special provision?

A. The Department should disallow the provision due to the lack of data and other substantiating evidence for its need.

Q. Does this conclude your testimony?

A. Yes.

Exhibit DOER-AEP-1

Earnings Sharing Mechanisms in Other Jurisdictions

	Company	Electric/Gas?	State	Benchmark	Sharing Mechanism
1	San Diego Gas & Electric Co. Effective 5/11/2005	Electric/Gas	CA	8.18%	S/H% R/P% 8.18-8.68 100% 00% 8.69-9.18 25 75 9.19-9.43 35 65 9.44-9.68 45 55 9.69-9.93 55 45 9.94-10.18 65 35 10.19-11.43 75 25 300 Bps & Above – Suspension
2	Southern California Gas (1998 and 1999)	Gas	CA	9.49%	Bps S/H% R/P% +300 100% 0% 250 95 5 200 85 15 150 75 25 125 65 35 100 55 45 75 45 55 50 35 65 25 25 75 0 100 0 -175 Offramp 2 consecutive years
3	Southern California Gas Effective 5/11/2005	Gas	CA	8.68%	S/H% R/P% 8.68-9.18 100% 00% 9.19-9.68 25 75 9.69-9.93 35 65 9.94-10.18 45 55 10.19-10.43 55 45 10.44-10.68 65 35 10.69-11.68 75 25 300 Bps & Above – Suspension
4	Narragansett Electric Company (1/2005)	Electric	RI	10.50%	S/H% R/P% 10.5-11.5 50% 50% >11.5 25% 75%
5	Atlanta Gas Light Company (May 2002)	Gas	GA	11.00%	Bps S/H% R/P% <=200 100% 0% >200 25% 75%

	Company	Electric/Gas?	State	Benchmark	Sharing Mechanism		
6	Otter Tail Power Company (2001-2005)	Electric	ND	12.00%	Bps <11.0% >13.0%	S/H% 50% 50%	R/P% 50% 50%
7	Boston Gas Company (DTE 96-50)	Gas	MA	11.00%	<7.0% > 15.0%	S/H% 50% 50%	R/P% 50% 50%
8	Central Maine Power (July 1996)	Electric	ME	10.55%	<7.05% > 14.05%	S/H% 50% 50%	R/P% 50% 50%
9	Consolidated Edison (April 1995)	Electric	NY	11.10%	Bps 50-150 >150 50% to reduce rate base balances as determined by the company	S/H% 50% 25%	R/P% 50% 25%
10	Montana Power Company (April 1996)	Electric/Gas	MT	11.00%	Bps >40 <-80 Shareholders can access Federal Accumulated Deferred Investment Tax Credit (Subject to IRS Approval)	S/H% 50%	R/P% 50%
11	Niagara Mohawk Power Corp. (2002)	Electric	NY	10.60%	>12.0%	S/H% 50%	R/P% 50%
12	New England Gas (2001-2005)	Gas	RI	11.25%	11.25-12.25% 12.25% +	S/H% 50% 75%	R/P% 50% 25%
13	Louisville Gas and Electric Company (2001-2003)	Gas/Electric	KY	11.50%	<10.5% >12.5%	S/H% 60% 60%	R/P% 40% 40%
14	Narragansett Electric Co. (2000-2004)	Electric	RI	12.00%	12-13% >13%	S/H% 50% 25%	R/P% 50% 75%

	Company	Electric/Gas?	State	Benchmark	Sharing Mechanism		
15	Ameren	Electric	MO	13.50%		S/H%	R/P%
	Corporation				12.6%-14%	50%	50%
	(1995-2001)				14%-16%	10%	90%
					>16%	0%	100%

Bps=Basis Points
S/H%=Shareholder Share of Overage or Shortage
R/P%=Ratepayer Share of Overage or Shortage